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Allergic reaction to acrylic resin in a patient with a provisional crown: case report

Mesquita, Alfredo Mikail Melo ; Silva, Juliano H M ; Kojima, Alberto Noryuki ; Moura, Renata Vasconcelos ;
Giovani, Elcio Madaglena ; Özcan, Mutlu

Abstract: Acrylic resins are widely used in dentistry, especially in orthodontics and prosthetics. Patients: this article reports the case of a leukodermic 33-year-old male who reported discomfort and pain due to an erythematous lesion in the first left premolar after the placement of an acrylic resin temporary restoration. Discussion: The signs and symptoms presented by the patient and his report of visiting the rural countryside generated concern regarding the possible diagnosis, which led to a more invasive biopsy to differentiate allergic inflammation from a paracoccidioid mycosis. Incisional. Biopsy revealed a chronic inflammatory process. Conclusion: the pathology was caused by contact with methyl methacrylate-based provisional acrylic resin.

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Allergic reaction to acrylic resin in a patient with provisional crown

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Short title: *Allergic reaction to acrylic resin*

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ABSTRACT

Acrylic resins are widely used in dentistry, especially in orthodontics and prosthetics. This article reports the case of a 33-year-old male who reported discomfort and pain due to an erythematous lesion in the first left premolar after the placement of a temporary restoration. Incisional biopsy revealed a chronic inflammatory process. The pathology was caused by contact with methyl methacrylate-based provisional acrylic resin.

Keywords: Allergic reaction; acrylic resin

INTRODUCTION

In recent decades, many substitutes have been developed for methyl methacrylate acrylic resins in response to many reports of allergic reactions, chemical irritation, and a burning sensation in the mouth. However, methyl methacrylate acrylic resins are still widely used in dentistry because of their low cost, ease of use, and varied applications.¹

Generally, allergic reactions to acrylic are localized events, but there are different clinical presentations. Ruiz-Genao et al.² mentioned lip swelling in a case of allergy to methyl methacrylate. Lunder and Rogl Butina³ reported systemic involvement, as manifested by chronic urticaria, as a symptom of an allergic reaction.

Patient's most common complaint associated with methyl methacrylate acrylic resins is a burning sensation in the mouth⁴⁻⁶ that is usually located in the mucosa of the palate in direct contact with the upper dentures but can also occur in the tongue, buccal mucosa, and oropharynx.^{7,8}

The main clinical signs of allergy are redness, swelling, pain in the oral mucosa and vesicles, ulcers,⁴⁻⁶ and labial edema.² In this article, we report a case of an allergic reaction to methyl methacrylate-based resin after the fabrication of a temporary crown.

CASE REPORT

Patient CGL, a 33-year-old Brazilian male electronics engineer, married and leukodermic, reported to the Diagnostic Dental Clinic of the University Paulista - UNIP SP due to discomfort and pain in the first left premolar. The patient reported that he had sought treatment two months previously because he broke a tooth and that the dentist had prepared the tooth and installed a provisional acrylic crown. He had not yet returned for delivery of a permanent crown, and two months ago, he experienced discomfort and erythematous, bleeding gingiva.

Intraoral clinical examination revealed an erythematous lesion with granulomatous features that bled upon contact and was approximately 1.5 cm in diameter in the region of the marginal and attached gingiva of the lower left premolar. Periapical radiography was performed and showed no abnormalities, and probing around the boundary of the crown to verify its adaptation and the presence of excess material or cement revealed parameters that were all within normal limits (Fig. 1).

After examining the clinical characteristics of the lesion, the patient was questioned about his recent travel to the countryside, where the patient often visits relatives. The diagnosis of chronic inflammation and/or *Paracoccidioides brasiliensis* infection was established.

An incisional biopsy of the lesion was taken from the vestibular region and sent to the pathology laboratory for processing. The microscopic examination revealed MREC 03 tissue fragments of different sizes and shapes that were brownish and firm, together measuring 0.2 x 0.2 x 0.1 cm². The fragmented mucosa was lined by keratinized stratified

squamous epithelium and showed areas of acanthosis and hydropic degeneration. The lamina propria consisted of dense connective tissue that exhibited chronic inflammatory infiltrate with no evidence of granulomatous inflammation; therefore, the diagnosis of chronic inflammation was made (Fig. 2).

Considering the above factors, we concluded that the causal agent was the provisional luting acrylic resin. After biopsy, a low-intensity laser (gallium arsenide and aluminum [GaAlAs] laser, 790-nm wavelength with a power of 30 mW) was applied for 2 minutes and 20 seconds on the surgical site, generating an energy density of 4 J/cm² to stimulate tissue repair, analgesia, and anti-inflammatory action.

The patient was reevaluated on the 3rd and 7th days and exhibited an evident improvement. The patient was referred to a dental surgeon who continued treatment, and after cementation of the final crown, the inflammatory signs and symptoms disappeared (Fig. 3).

DISCUSSION

The signs and symptoms presented by the patient and his report of visiting the rural countryside generated concern regarding the possible diagnosis, which led to a more invasive biopsy to differentiate allergic inflammation from a paracoccidioid mycosis.

Paracoccidioid mycosis is a disease caused by inhalation of the fungus *Paracoccidioides brasiliensis*, which rarely contaminates skin wounds. Also called mycosis, this infection can affect all organs, most often the adrenal organs, and is characterized by pulmonary symptoms, ulcerated lesions of the skin and mucous membranes, and lymphadenopathy.

In the oral cavity, stomatitis that presents as thin, hemorrhagic tissue is known as moriform stomatitis of Aguiar-Pupo. It has two forms: regressive and progressive.

In its regressive form, the disease has mild clinical manifestations, generally in the lungs, and presents spontaneous regression independent of treatment. The progressive form involves one or more organs and can lead to death if not treated properly.

There are many reports of allergic reactions to methyl methacrylate in dentures or orthodontic appliances, and the main cause is the residual monomer polymerization reaction. Because of this, the residual monomer content of acrylic resins polymerized by heat has been extensively studied, and many researchers have tried to determine the most effective curing cycle to achieve low levels of residual monomer.⁹⁻¹¹

Self-polymerizable resins have a great disadvantage in this respect. Without a source of heat, the material requires a chemical activator to establish a large number of chemical bonds. As a result, there are significantly higher levels of uncured material, which vary depending on each product's composition and processing techniques.

CONCLUSIONS

Methyl methacrylate-based resins can lead to allergic reactions, and it is important that dentists are aware of the reactions that can occur with dental materials. Diagnosis should be made by a multidisciplinary team. The treatment often involves the removal of the acrylic resin and replacement with alternative materials.

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DISCLOSURE

The authors declare that they have no conflict of interest.

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Legends for figures:

Figures:

Figures 1. Erythematous lesion with granulomatous features.

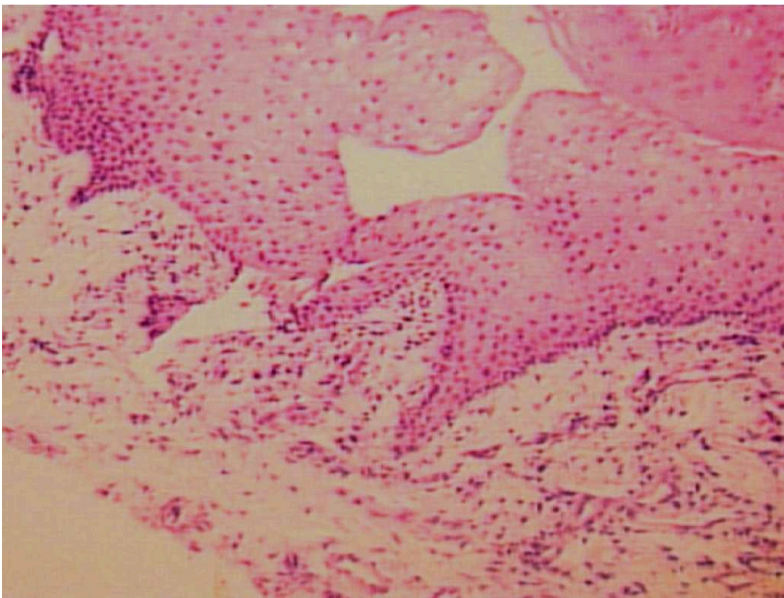
Figures 2. The lamina propria consisted of dense connective tissue that exhibited chronic inflammatory infiltrate.

Figures 3. After cementation of the final crown, the inflammatory signs and symptoms disappeared.

Figures:



Figures 1. Erythematous lesion with granulomatous features.



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